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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,665	09/23/2003	Jean-Claude Yvin	P08425US00/BAS	1061

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STITES & HARBISON PLLC
1199 NORTH FAIRFAX STREET
SUITE 900
ALEXANDRIA, VA 22314

EXAMINER	
OLSON, ERIC	

ART UNIT	PAPER NUMBER
1623	

NOTIFICATION DATE	DELIVERY MODE
09/16/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

iplaw@stites.com

Office Action Summary	Application No.	Applicant(s)	
	10/668,665	YVIN ET AL.	
	Examiner	Art Unit	
	ERIC S. OLSON	1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-7,10 and 11* is/are pending in the application.

4a) Of the above claim(s) *11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-7 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on June 24, 2010 has been entered.

Detailed Action

This office action is a response to applicant's communication submitted June 24, 2010 wherein the rejections of record in the previous office action are traversed. This application was filed September 23, 2010, and makes no priority claims.

Claims 1, 5-7, 10, and 11 are pending in this application.

Claim 11 is withdrawn from consideration as being drawn to a non-elected invention.

Claims 1, 5-7, and 10 as amended are examined on the merits herein.

Applicant's arguments and evidence, submitted June 24, 2010, have been fully considered with respect to the rejection of instant claims 1, 5-7, and 10 under 35 USC 103(a) for being obvious over Kong et al., have been fully considered and found to be persuasive to remove the rejection as Applicant has demonstrated that chemical

synthesis of a specific oligosaccharide is complex and cannot be taken for granted by one skilled in the art. Therefore the rejection is withdrawn.

The following new grounds of rejection are introduced:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5-7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kong et al. (PCT International publication WO01/44263, Reference and English translation of record in previous action) in view of Shoji et al. (US patent 5498602, cited in PTO-892)

Kong et al. discloses oligosaccharides with immunostimulating and antitumor activity. (p. 6, first paragraph of the translation) The oligosaccharides fall within a general formula [I] that includes both branched (when m is 1-4) or unbranched (when m is 0) saccharides. (p. 6 last paragraph - p. 7 second paragraph of the translation) In a preferred embodiment, the saccharides are all glucose and are linked by beta 1,3 linkages. (p. 7 paragraphs 5 and 6, p. 8 first paragraph, translation) Tetrasaccharides and pentasaccharides are preferred. (p. 8 third paragraph, translation) The oligosaccharides can be used in a method for treating cancer by injection or oral administration. (p. 22, third paragraph, translation) They work by inducing expression of

LI-2 and TNF-alpha in the peripheral blood. (p. 22, last paragraph, translation) The saccharides are disclosed in pharmaceutical formulations comprising pharmaceutical solutions and tablets. (p. 45 last paragraph - p. 47 first paragraph, translation) Kong et al. does not explicitly disclose an unbranched saccharide having all the characteristics recited in the instant claims or a method of making said saccharide.

Shoji et al. discloses the isolation of laminaripentaose, which is the beta-glucan pentasaccharide of the claimed invention. (column 39 lines 17-30) This demonstrates that one skilled in the art is able to obtain this unbranched pentasaccharide.

It would have been obvious to one of ordinary skill in the art at the time of the invention to treat a subject in a method according to Kong et al. using an unbranched beta 1,3-glucan tetrasaccharide or pentasaccharide. One of ordinary skill in the art would have been motivated to use a 1,3-beta-glucan tetrasaccharides or pentasaccharide because all of these qualities (length, 1,3-beta bonds, glucose residues) are disclosed by Kong et al. as preferred embodiments of the invention. One of ordinary skill in the art would have been motivated to use an unbranched saccharide because Kong et al. discloses in formula [I] that the saccharides can be unbranched. One of ordinary skill in the art would reasonably have expected success because these saccharides are included within the broad teaching of Kong et al. as having the disclosed antitumor activity.

Furthermore, regarding how one skilled in the art could obtain laminaripentaose oligosaccharide, Shoji et al. demonstrates that it is possible for one skilled in the art to obtain this unbranched oligosaccharide. Therefore one of ordinary skill in the art would

have been able to make the pentasaccharide of the claimed invention in the same manner of Shoji et al.

Therefore the invention taken as a whole is *prima facie* obvious.

Claims 1, 5-7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kong et al. (PCT International publication WO01/44263, Reference and English translation of record in previous action) in view of Katsuraya et al. 1 (Reference U included with PTO-892)

Kong et al. discloses oligosaccharides with immunostimulating and antitumor activity. (p. 6, first paragraph of the translation) The oligosaccharides fall within a general formula [I] that includes both branched (when m is 1-4) or unbranched (when m is 0) saccharides. (p. 6 last paragraph - p. 7 second paragraph of the translation) In a preferred embodiment, the saccharides are all glucose and are linked by beta 1,3 linkages. (p. 7 paragraphs 5 and 6, p. 8 first paragraph, translation) Tetrasaccharides and pentasaccharides are preferred. (p. 8 third paragraph, translation) The oligosaccharides can be used in a method for treating cancer by injection or oral administration. (p. 22, third paragraph, translation) They work by inducing expression of LI-2 and TNF-alpha in the peripheral blood. (p. 22, last paragraph, translation) The saccharides are disclosed in pharmaceutical formulations comprising pharmaceutical solutions and tablets. (p. 45 last paragraph - p. 47 first paragraph, translation) Kong et al. does not explicitly disclose an unbranched saccharide having all the characteristics recited in the instant claims or a method of making said saccharide.

Katsuraya et al. 1 discloses a synthetic method involving the acetylation and glycosyl modification of oligosaccharides including laminaripentaose, one of the oligosaccharides included in the instant claims. (p. 53 scheme1) The laminaripentaose starting material was produced enzymatically using a bacterial enzyme. (p. 59 first paragraph) This demonstrates that one skilled in the art is able to obtain the claimed unbranched pentasaccharide.

It would have been obvious to one of ordinary skill in the art at the time of the invention to treat a subject in a method according to Kong et al. using an unbranched beta 1,3-glucan tetrasaccharide or pentasaccharide. One of ordinary skill in the art would have been motivated to use a 1,3-beta-glucan tetrasaccharides or pentasaccharide because all of these qualities (length, 1,3-beta bonds, glucose residues) are disclosed by Kong et al. as preferred embodiments of the invention. One of ordinary skill in the art would have been motivated to use an unbranched saccharide because Kong et al. discloses in formula [I] that the saccharides can be unbranched. One of ordinary skill in the art would reasonably have expected success because these saccharides are included within the broad teaching of Kong et al. as having the disclosed antitumor activity.

Furthermore, regarding how one skilled in the art could obtain laminaripentaose oligosaccharide, One of ordinary skill in the art would have been motivated to obtain this saccharide using the enzymatic method disclosed by Katsuraya et al. 1. Therefore one of ordinary skill in the art would have been able to make the pentasaccharide of the claimed invention in the same manner of Katsuraya et al.

Therefore the invention taken as a whole is *prima facie* obvious.

Claims 1, 5-7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kong et al. (PCT International publication WO01/44263, Reference and English translation of record in previous action) in view of Katsuraya et al. 2 (Reference V included with PTO-892)

Kong et al. discloses oligosaccharides with immunostimulating and antitumor activity. (p. 6, first paragraph of the translation) The oligosaccharides fall within a general formula [I] that includes both branched (when m is 1-4) or unbranched (when m is 0) saccharides. (p. 6 last paragraph - p. 7 second paragraph of the translation) In a preferred embodiment, the saccharides are all glucose and are linked by beta 1,3 linkages. (p. 7 paragraphs 5 and 6, p. 8 first paragraph, translation) Tetrasaccharides and pentasaccharides are preferred. (p. 8 third paragraph, translation) The oligosaccharides can be used in a method for treating cancer by injection or oral administration. (p. 22, third paragraph, translation) They work by inducing expression of LI-2 and TNF-alpha in the peripheral blood. (p. 22, last paragraph, translation) The saccharides are disclosed in pharmaceutical formulations comprising pharmaceutical solutions and tablets. (p. 45 last paragraph - p. 47 first paragraph, translation) Kong et al. does not explicitly disclose an unbranched saccharide having all the characteristics recited in the instant claims or a method of making said saccharide.

Katsuraya et al. 2 discloses that laminara-oligosaccharides having five or more 1,3-beta-glucosyl subunits can be made by chemical hydrolysis or acetolysis of curdlan.

(p. 6696, left column scheme 1, left column third paragraph - right column first paragraph) This demonstrates that one skilled in the art is able to obtain the claimed unbranched pentasaccharide.

It would have been obvious to one of ordinary skill in the art at the time of the invention to treat a subject in a method according to Kong et al. using an unbranched beta 1,3-glucan tetrasaccharide or pentasaccharide. One of ordinary skill in the art would have been motivated to use a 1,3-beta-glucan tetrasaccharides or pentasaccharide because all of these qualities (length, 1,3-beta bonds, glucose residues) are disclosed by Kong et al. as preferred embodiments of the invention. One of ordinary skill in the art would have been motivated to use an unbranched saccharide because Kong et al. discloses in formula [I] that the saccharides can be unbranched. One of ordinary skill in the art would reasonably have expected success because these saccharides are included within the broad teaching of Kong et al. as having the disclosed antitumor activity.

Furthermore, regarding how one skilled in the art could obtain laminaripentaose oligosaccharide, One of ordinary skill in the art would have been motivated to obtain this saccharide using the enzymatic method disclosed by Katsuraya et al. 2. Therefore one of ordinary skill in the art would have been able to make the pentasaccharide of the claimed invention in the same manner of Katsuraya et al.

Therefore the invention taken as a whole is *prima facie* obvious.

Claims 1, 5-7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kong et al. (PCT International publication WO01/44263, Reference and English translation of record in previous action) in view of Katsuraya et al. 3 (Reference W included with PTO-892)

Kong et al. discloses oligosaccharides with immunostimulating and antitumor activity. (p. 6, first paragraph of the translation) The oligosaccharides fall within a general formula [I] that includes both branched (when m is 1-4) or unbranched (when m is 0) saccharides. (p. 6 last paragraph - p. 7 second paragraph of the translation) In a preferred embodiment, the saccharides are all glucose and are linked by beta 1,3 linkages. (p. 7 paragraphs 5 and 6, p. 8 first paragraph, translation) Tetrasaccharides and pentasaccharides are preferred. (p. 8 third paragraph, translation) The oligosaccharides can be used in a method for treating cancer by injection or oral administration. (p. 22, third paragraph, translation) They work by inducing expression of LI-2 and TNF-alpha in the peripheral blood. (p. 22, last paragraph, translation) The saccharides are disclosed in pharmaceutical formulations comprising pharmaceutical solutions and tablets. (p. 45 last paragraph - p. 47 first paragraph, translation) Kong et al. does not explicitly disclose an unbranched saccharide having all the characteristics recited in the instant claims or a method of making said saccharide.

Katsuraya et al. 3 discloses that laminaritetraose and laminaripentaose can be obtained by hydrolysis of curdlan. (abstract) This demonstrates that one skilled in the art is able to obtain the claimed unbranched pentasaccharide.

It would have been obvious to one of ordinary skill in the art at the time of the invention to treat a subject in a method according to Kong et al. using an unbranched beta 1,3-glucan tetrasaccharide or pentasaccharide. One of ordinary skill in the art would have been motivated to use a 1,3-beta-glucan tetrasaccharides or pentasaccharide because all of these qualities (length, 1,3-beta bonds, glucose residues) are disclosed by Kong et al. as preferred embodiments of the invention. One of ordinary skill in the art would have been motivated to use an unbranched saccharide because Kong et al. discloses in formula [I] that the saccharides can be unbranched. One of ordinary skill in the art would reasonably have expected success because these saccharides are included within the broad teaching of Kong et al. as having the disclosed antitumor activity.

Furthermore, regarding how one skilled in the art could obtain laminaritetraose or laminaripentaose oligosaccharides, One of ordinary skill in the art would have been motivated to obtain this saccharide using the enzymatic method disclosed by Katsuraya et al. 3. Therefore one of ordinary skill in the art would have been able to make the tetrasaccharide or pentasaccharide of the claimed invention in the same manner of Katsuraya et al.

Therefore the invention taken as a whole is *prima facie* obvious.

Response to Arguments

In the response submitted June 24, 2010, Applicant argues that the synthesis of oligosaccharides is too unpredictable for one of ordinary skill in the art to be able to

predictably make the unbranched oligosaccharides taught by Kong et al. However, as mentioned in the new grounds of rejection, several references have been cited that show that one of ordinary skill in the art could obtain the claimed tetrasaccharide and pentasaccharide by chemical or enzymatic hydrolysis of lentinan or curdlan. Therefore the cited prior art is enabling for the claimed invention.

Applicant further cites the reference Vetvicka et al. to argue that the biological activity of beta glucans is unpredictable and that therefore one of ordinary skill in the art would not regard the disclosure of the unbranched oligosaccharides of Kong et al. as enabling. However, the teaching of Vetvicka et al. is a generic teaching applied to glucan polysaccharides as a whole, and does not serve to overcome the specific statements of Kong et al. regarding the specific claimed glucan oligosaccharides.

As repeated previously, Kong et al. teaches a broad variety of different oligosaccharides, and then identifies glucans having 4 or 5 saccharides in the main chain as specific embodiments. By contrast, the different glucan samples analyzed by Vetvicka et al. are long-chain, heterogeneous polysaccharide compositions obtained from differing natural sources (e.g. barley, yeast, maitake) and having various compositions of molecular weight, main chain linkages, and side chain linkages, and are much more heterogeneous than the specific saccharides disclosed by Kong et al. In other words, the differences between these samples are much greater than the difference between the branched and unbranched saccharides disclosed by Kong et al. Vetvicka et al. discloses that these different commercial glucan preparations have different biological activity but does not identify which structural features are responsible

for the variance. Therefore the cited article does not provide sufficient evidence to rebut the teaching of Kong et al. that laminaripentaose and laminaritetraose possess antitumor activity.

For these reasons the rejections are deemed proper and maintained.

Conclusion

No claims are allowed in this application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC S. OLSON whose telephone number is (571)272-9051. The examiner can normally be reached on Monday-Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on (571)272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eric S Olson/
Primary Examiner, Art Unit 1623
9/10/2010